AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A method, comprising:

identifying a noise problem in a cell-based integrated circuit design, the noise problem being associated with a victim driver coupled to a victim line and an aggressor driver coupled to an aggressor line;

performing an automated analysis of the noise problem within the context of the circuit design to identify an adjustment to the design, wherein the analysis is perturbation-aware within the context of the circuit design and includes at least in part: ~~and~~

determining that the victim driver is too weak for the victim line,

determining that line resistance dominates the noise problem,

if an appropriate buffer can be identified, selecting the appropriate buffer to be associated with the victim line as the adjustment, and

if no appropriate buffer can be identified, identifying a layer change as the adjustment;

automatically applying the adjustment to the circuit design; and

outputting information associated with the adjusted circuit design.

2-4. (Canceled)

5. (Currently Amended) The method of claim [4] 1, wherein identification of the appropriate buffer comprises:

selecting the smallest available buffer;

determining if the selected buffer resolves the noise problem; and

if the smallest available buffer does not resolve the noise problem, selecting the next larger buffer,

wherein the process is repeated until (i) an appropriate buffer is identified or (ii) it is determined that no available buffer is appropriate.

6. (Original) The method of claim 5, wherein the determination that that the victim driver is too weak for the victim line comprises:

calculating a ratio of the total switching cross-capacitance of the victim line to the total capacitance driven by the victim's driver; and

checking whether the ratio is smaller than a pre-determined threshold value.

7. (Currently Amended) The method of claim [3] 1, wherein the automated analysis at least in part includes:

determining that the victim driver is too weak for the victim line;

determining that driver resistance dominates the noise problem; and

identifying up-sizing the victim driver as the adjustment.

8. (Currently Amended) ~~The method of claim 7, wherein the determination that drive resistance does dominate the noise problem comprises~~ A method, comprising:

identifying a noise problem in a cell-based integrated circuit design, the noise problem being associated with a victim driver coupled to a victim line and an aggressor driver coupled to an aggressor line;

performing an automated analysis of the noise problem within the context of the circuit design to identify an adjustment to the design, wherein the analysis is perturbation-aware within the context of the circuit design and includes at least in part:

determining that the victim driver is too weak for the victim line,

determining that driver resistance dominates the noise problem by (i) calculating a ratio of a dynamically interpolated effective resistance of the victim driver to the resistance of the victim wire, and (ii) checking whether the ratio is larger than a pre-determined threshold value, and

identifying up-sizing the victim driver as the adjustment;

automatically applying the adjustment to the circuit design; and

outputting information associated with the adjusted circuit design.

9. (Currently Amended) The method of claim [1] 8, wherein the automated analysis may further determine that a manual review of the noise problem is required.

10. (Currently Amended) ~~The method of claim 1, wherein the automated analysis at least in part includes~~ A method, comprising:

identifying a noise problem in a cell-based integrated circuit design;

performing an automated analysis of the noise problem within the context of the circuit design to identify an adjustment to the design, including at least in part:

determining that a victim line is subject to significant cross-capacitance coupling;

if no single aggressor is causing a cross-capacitance coupling that significantly dominates the noise problem, identifying a shielding change as the adjustment; and

if a single aggressor is causing cross-capacitance coupling that significantly dominates the noise problem, identifying an adjustment with respect to that aggressor;

automatically applying the adjustment to the circuit design; and

outputting information associated with the adjusted circuit design.

11. (Original) The method of claim 10, wherein the determination that a single aggressor is causing cross-capacitance coupling that significantly dominates the noise problem comprises:

calculating a ratio of a coupled capacitance between that aggressor and the victim to the total capacitance driven by the victim's driver; and

checking whether the ratio is larger than a pre-determined threshold value.

12. (Original) The method of claim 10, wherein the adjustment with respect to that aggressor comprises:

if the noise problem is sensitive to a driver associated with the aggressor, identifying down-sizing that driver as the adjustment; and

if the noise problem is not sensitive to the driver associated with the aggressor, identifying a spacing change as the adjustment.

13. (Original) The method of claim 12, wherein a determination that the noise problem is sensitive to a driver associated with the aggressor comprises:

calculating a ratio of a victim time constant to an aggressor signal slope; and

comparing the ratio to a pre-determined threshold value.

14. (Currently Amended) The method of claim [1] 10, wherein the integrated circuit design is associated with standard cell designs implemented using a complimentary metal oxide semiconductor process.

15. (Currently Amended) The method of claim [1] 10, wherein ~~the automatic adjustment to the circuit design~~ said outputting comprises at least one of:

~~generating~~ (i) printing an engineering change order, (ii) transmitting an engineering change order, or (iii) providing adjusted scripts to a physical synthesis tool.

16. (Currently Amended) The method of claim [1] 10, wherein the automated analysis is associated with at least one of: (i) a noise avoidance process, [and] or (ii) a noise fixing process.

17. (Currently Amended) An article, comprising:

a computer-readable storage medium having stored thereon instructions that when executed by a machine result in the following:

identifying a noise problem in a cell-based integrated circuit design;

performing an automated analysis of the noise problem within the context of the circuit design to identify an adjustment to the design, including at least in part:

determining that a victim line is subject to significant cross-capacitance coupling,

if no single aggressor is causing a cross-capacitance coupling that significantly dominates the noise problem, identifying a shielding change as the adjustment, and

if a single aggressor is causing cross-capacitance coupling that significantly dominates the noise problem, identifying an adjustment with respect to that aggressor;

automatically applying the adjustment to the circuit design; and

outputting information associated with the adjusted circuit design.

18. (Canceled)

19. (Currently Amended) A system, comprising:

a cell-based integrated circuit definition unit to generate a circuit design;

an automated noise convergence unit to analyze a noise problem within the context of the circuit design to identify an adjustment to the design, wherein the adjustment is automatically applied to the circuit design and includes, at least in part:

determining that a victim line is subject to significant cross-capacitance coupling,

if no single aggressor is causing a cross-capacitance coupling that significantly dominates the noise problem, identifying a shielding change as the adjustment, and

if a single aggressor is causing cross-capacitance coupling that significantly dominates the noise problem, identifying an adjustment with respect to that aggressor; and

an automated noise convergence output to transmit information associated with an adjusted circuit design.

20. (Canceled)